

$$A_s = 7.68$$

$$f_c = 4,000 \text{ psi}$$

$$T = A_s F_y = (7.68 \text{ in}^2) (50 \text{ ksi}) = 384 \text{ k}$$

$$A_s F_y = 0.85 f_c' b \times a$$

$$a = \frac{A_s F_y}{0.85 f_c' b} = \frac{384 \text{ k}}{0.85 (4) (12 \times 10'')} = 0.78''$$

$$M_n = A_s F_y \left(d/2 + t - a/2 \right) \leftarrow \begin{matrix} \text{SUM} \\ \text{ABOUT} \\ \text{T.O.S.} \end{matrix}$$

$$= 384 \left(15.9/2 + 6'' - 0.78/2 \right) = 5807 \text{ k-in}$$

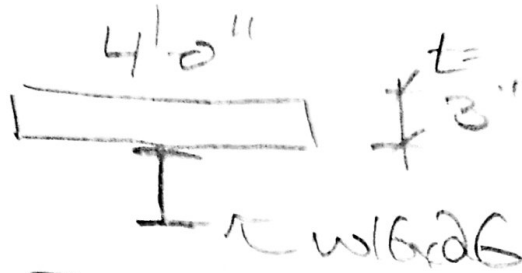
$$M_n = 434 \text{ k-ft}$$

$$\phi M_n = 310 \text{ k-ft}$$

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E)

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(33)
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Ex 2



$$f_c = 3000 \text{ psi}$$

$$A_s = 7.68$$

$$f_c = 3000$$

$$b_f = 55 \text{ in}$$

$$t_f = 0.345 \text{ in}$$

$$T = A_s F_y = 384 \text{ k}$$

$$a = A_s F_y / (0.85 f_c b) = \frac{384 \text{ k}}{0.85 (3) (41.0)}$$

$$a = 3.13'' > t = 3 \text{ NC. } \uparrow \text{ PNA IN STEEL}$$

$$0.85 f_c b t + F_y b_f \bar{y} = A_s F_y - F_y b_f \bar{y}$$

$\underbrace{\hspace{1.5cm}}_{C_c} \quad \underbrace{\hspace{1.5cm}}_{C_s} \quad \underbrace{\hspace{1.5cm}}_{T_s \text{ (FULL SECTION)}} \quad \underbrace{\hspace{1.5cm}}_{C_s \text{ (FLANGE FORCE)}}$

$$\bar{y} = \frac{F_y A_s - 0.85 f_c b e x t}{2 F_y b_f}$$

$$\bar{y} = \frac{384 - 0.85 (3) (41.0) (3)}{2 (50) (5.5)} = 0.03''$$

$$M_n = 0.85 f_c b t (t/2) + F_y A_s (d/2) - 2 F_y b_f \bar{y} (t/2)$$

$$= 0.85 (3) (41.0) (3) (3/2) + 384 (159/2) - 2 (50) (5.5) (0.03)$$

$$= 550 + 3053 - 0.25 = 3601 \text{ k-ft}$$

$$\phi M_n = 270 \text{ k-ft}$$